

manipulations of a cooking on/off button, which directly controls the voltage supply to the DC microwave oven, are required to fully accept the large currents from the DC power supply of the DC battery.

However, there exists a problem in that the switches for the large current is hardly manufactured as well as requires a high manufacturing cost.

Further, the DC microwave oven satisfies interlock regulations required by standard institutes for microwave ovens. That is, the DC microwave oven should be in a structure that it does not drive the magnetron thereof in a short-circuit state of the primary interlock switch and the secondary interlock switch.

In addition to the above, the microwave oven is required to have a structure of protecting circuit components through the suppression of excessive current inflow from a DC power source.

SUMMARY OF THE INVENTION

The present invention is devised to solve the above problem and meet the requirements, and an object of the present invention is to provide a driving circuit of a DC microwave oven and a method of controlling the same, capable of protecting circuit components against excessive currents inflowing from a DC power supply.

Another object of the present invention is to provide a driving circuit of a DC microwave oven and a method of controlling the same, capable of switching on and off a DC power supply through switches of a small capacity and satisfying the interlock regulations of microwave ovens.

In order to achieve the above objects, according to an embodiment of the present invention, in a driving circuit of a DC microwave oven having an inverting unit for converting a DC voltage of a DC power supply into an AC voltage by driving pulses, a high voltage transformer for transforming the AC voltage applied by the driving of the inverter unit and supplying the transformed AC voltage to a magnetron, and a pulse driving unit for generating the driving pulses, an excessive current detecting unit is provided for detecting a current supplied from the DC power supply to the inverting unit, and outputting an excessive current detecting signal to the pulse driving unit to cut off the generation of the driving pulses of the pulse driving unit if the detected current corresponds to an excessive current.

Preferably, the excessive current detecting unit includes an excessive current detecting part for detecting a current supplied to the inverting unit; and a comparison part for comparing a detecting signal outputted from the excessive current detecting part with a predetermined reference signal, and outputting a comparison result signal, wherein the pulse driving unit stops the generation of the driving pulses if the comparison result signal of the comparator corresponds to the excessive current detecting signal.

It is preferable that the excessive current detecting part includes plural bipolar transistors driven in the same periods as the inverting unit with an input of the driving pulses.

Further, an excessive current maintaining unit is further included for continuously maintaining the excessive current detecting signal if the excessive current detecting signal occurs from the excessive current detecting part.

The excessive current maintaining unit includes a feedback transistor turned on with an input of a feedback control signal outputted from the pulse driving unit; and a diode

connected between the comparator and the feedback transistor to continuously output to the comparator the feedback signal higher than a reference signal in correspondence with the turn-on of the feedback transistor, the pulse driving unit outputting the feedback control signal in response to the excessive current detecting signal of the comparator.

Further, in order to achieve another object, according to another embodiment of the present invention, in a driving circuit of a DC microwave oven having an inverting unit for converting a DC voltage of a DC power supply into an AC voltage by driving pulses, a high voltage transformer for transforming the AC voltage applied by the driving of the inverting unit and supplying the transformed AC voltage to a magnetron, and a pulse driving unit for generating the driving pulses, a switching unit is provided to be mounted to turn on and off the voltage supply to the pulse driving unit according to the opening and closing operations of a cooking chamber door.

Preferably, the switching unit includes a door sensing switch mounted to directly or indirectly turn on and off a voltage supply path to a voltage input terminal of the pulse driving unit according to the opening and closing states of the cooking chamber door; and a primary interlock switch connected in the voltage supply path to the voltage input terminal of the pulse driving unit to be turned on and off according to the opening and closing operations of the cooking chamber door.

It is preferable that a switch monitor switch is further provided for cutting off the supply of the DC voltage to the high voltage transformer when the cooking chamber door is in the open state.